THE AMERICAN ARCHITECT AND BUILDING NEWS.

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THE bill for the establishment of a Bureau of Architecture was introduced into the House of Representatives, several days ago, by Mr. Hewitt of New York, and was referred to the committee on public buildings and grounds. What degree of support it will command in the committee, or in the House, or even from the public, it is difficult to foresee; but we presume that, out of Congress at least, most thoughtful people will agree on the importance of taking some action to release the government architectural work from political influence; and that our profession is well convinced that the main provision of the bill — the employment of various architects to design the public buildings of the country — is a sound one. Some strictures of the Evening Post, written in evident ignorance of the character of the bill, have called out a letter from Mr. Hewitt, in which he briefly indicates its bearing, without expressing his own opinion upon it, and says that a second bill is in preparation, in the Treasury Department, to meet the same need.

A LITTLE publication of some value to those of our architects who are interested in what goes on outside their own country is the *Agenda Special des Architectes*, published by Morel in Paris. It is a diary which is published annually for the use of French architects, and contains a separate *cahier* full of information of professional value. It gives, besides the statistics of administration, postage, &c., which are common to all diaries, a list of all the government appointments in architecture, the staff of the Ministry of Fine Arts and of the *Ecole des Beaux Arts*, the commissions on the *Monuments Historiques*, on religious arts and edifices, the list of diocesan architects and conservators of buildings, the temporary building-appointments of architects, and the building commissioners (these last two classes for Paris only.) It also gives the principal laws which prescribe the treatment of buildings, so far as concerns their alignement and street aspect, the height of walls and roofs, — which in Paris are rigidly fixed according to the width of the street on which they are built, — laws for paving, sewage, the management and taxation of gas and water pipes, the taxes which are levied on the frontage and features, great and small, of buildings, and the tariff of architects' and surveyors' fees, besides the ordinary series of tables of weights and measures, prices, strength and weight of materials, &c. The most curious points to an American will be the great number of architectural appointments in the gift of the Government, of which there must be two or three hundred, and the tariff of excise for the various portions of a building; for in Paris not only are the materials of a building taxed at the barriers as they enter, but every part and feature pays its tax of *Grande Voirie* or *Petite Voirie* for the right to exist and appear on the public streets. Not only are building taxed for their frontage, from five to seven francs per metre, according to the width and consequent importance of the street they front on, but every window, door, cornice, balcony, iron column, gutter-spout, blind, ventilator, stove-pipe, or other feature that can be classed, is taxed, till, in reading the list, one involuntarily recalls Sydney Smith's famous picture of the taxed Englishman's death.

WE would call the attention of our readers to a series of articles on the Graphical Analysis of Roof-trusses, by Prof. Greene of Michigan University, which are now publishing in the Chicago Engineering News. The graphical method of solving statical problems is one which has been developed in Germany during the last ten years, and, though brought somewhat into notice in England by Prof. Clark Maxwell's analysis of certain roof-trusses, is only now becoming generally known. It has the advantage of enabling constructors who are not versed in mathematics, to determine, with sufficient accuracy for all practical uses, the various strains to be provided for in their constructions. And in many cases of complex relations it materially assists the trained engineer by substituting a comparatively easy graphical solution of his problems for a laborious and abstruse calculation, — as, for instance, in computing the strains of continuous grades, besides giving an independent means by which he may check his algebraic computations when he makes them. This system was first shown in a complete form in a German work published by Colmann in 1866, who developed it by means of *transversals*, a somewhat complicated system of enharmonic relations, for which, by the labors of other investigators, a simpler means of analysis has been substituted. Prof. Greene had already published a small book on the subject, in which, however, he limited his discussion mainly to bridge-grades. In these papers in the Engineering News, he takes up the study of various forms of roof-trusses, an ill-understood subject, which is of great importance to architects and builders, and which he treats in a way that should enable men who lack facility in computations, but yet wish for thorough and accurately contrived work, to arrange their constructions with exact reference to the strains they have to bear. The pressure of wind, an element in the stability of roofs, whose importance is not commonly understood, is carefully studied in these papers. The graphical analysis has also been considered by Mr. Dubois in a series of papers published not long ago in Van Nostrand's Magazine, and since issued in book form; and also in a large work in two volumes entitled "Graphical Statics," and recently published by John Wiley & Sons. The subject is of such practical importance that it ought to be studied by every constructor, and must soon be introduced into the *curricula* of all our engineering and technological schools.

A CORRESPONDENT takes issue with us for our disapproval, expressed in a former number, of the practice of architects who regularly work for less than the established commissions, and argues against the system of charging by percentages. There are advantages and disadvantages in the present system, and its merits are a fair subject for discussion; but what we said had no reference to them, and applies equally to any system that may be adopted, provided only that there be a system. We object distinctly to the principle of every man for himself. The first advantage of all social union, and civil government even, is that they relieve the individual from the necessity of self-protection. This is the essential difference between a civilized and an uncivilized community; and the usages of the various professions in their charges are illustrations of it in a small way. Not only does the combined experience of the community settle the rate of compensation more fairly than that of an individual is likely to do, but the usage so established is a most essential safeguard; and to abandon it is to ex-

pose the practitioner to the necessity of constant self-defence, to the danger of endless disagreement and litigation, and the profession to a condition of discord, underbidding, and rivalry, to which the present state of things is, in comparison, tranquil and concordant. Every class of men has found it to its advantage to have a fixed rule of payment: banks have their discount-rates, dealers their market-prices, professional men their fees; and, in every class, the most respected men have been the most systematic in their adherence to it. So much for the advantage of a regular and well-known usage as to payment. The manner of fixing it is a difficult question, and one which we do not at present propose to discuss.

Our correspondent thinks that we did injustice in saying that, when an architect worked habitually below the current rates, there must be something wrong. We took pains to except certain conditions under which there is reason to discount from the established compensation. But this compensation has been fixed on the experience of many nations, through many years; and, whatever may be said of the manner of computing it, it cannot be said that the amount of it is, in the long average, any more than a reasonable return for the architect's labor, if he does his work faithfully. When, therefore, he works, not occasionally and for special reasons, but habitually, at prices much below this compensation, it is entirely safe to say that his work is either underpaid or underdone. Moreover, the common observation of architects will warrant us, we are sure, in having said, that, "in the long-run, the client may fairly conclude that diminished fees mean diminished service, if nothing worse," and in adding, that, whatever honorable men may be found with them, it is unquestionable that, among those who accept diminished fees, are to be found most, if not all, of those who eke out their commissions in ways unknown to their clients.

Another correspondent suggests that it would be well to publish in the Architect, for the benefit of architectural students and draughtsmen, a compendium of laws and rules of perspective. This is a matter which we have had in consideration for some time; and we hope by and by to be able to accomplish it satisfactorily.

We wish to urge on our contributors the importance of sending plans, and especially descriptions, with their drawings. The interest of an exterior is, in a great degree, dependent on its adaptation to its place; and, if it merits publishing, it deserves a description. The neglect to send the description involves a loss of attention to the design on the part of the readers of the paper, or else a serious waste of the editor's time in correspondence and hunting up descriptions, and often both. We publish without comment many designs which deserve descriptions, because these either are not sent, or are received too late for publication.

THE BUREAU BILL.

The bill for the establishment of a Bureau of Architecture, which we publish in another column, is intended to correct some serious faults in the present system of conducting the architectural work of the Government. The Supervising Architect, Mr. Potter, in his report of last fall, called the attention of the Secretary of the Treasury to the incompatibility of the various duties which now fall to the Supervising Architect, and argued, in a way which those who are acquainted with the work of his office must approve, the impossibility that an officer who was burdened with such an amount of executive work should be able to do satisfactorily the amount of designing required of him under the present arrangement. The provision for removing this difficulty is the gist of the bill; the need of it is its *raison d'être*. The bill was drawn under the direction of the trustees of the American Institute of Architects, was discussed at considerable length in their Convention last fall, and has since been revised by a committee appointed for that purpose, who have been in consultation with the Supervising Architect. It has therefore been considerately studied, and should be received with the respect due to its careful preparation. It is nevertheless worth while to examine its details somewhat critically.

We cannot help feeling that the bill would have been stronger if the Institute had suppressed itself a little more. The question is a delicate one. It is provided that the Government Architect shall be a member of the Institute; and that, of the board or boards of experts whom he is to call together to assist him in deciding the competitions which are to be established for the design of government buildings, three members out of four shall also belong to the Institute. It is very desirable certainly, considering the disregard of personal fitness with which appointments are made, to establish what security is possible for the professional standing and capability of the Government Architect. And although capable men could be selected from without the Institute, and incapable men from within it, yet since it is the only body in the United States which offers any professional guaranty at all for architects, and since it is safe to say, we believe, that the average professional attainment of the men within is on the whole above that of the men without; since, further, the members of the Institute, by the fact of their union, and of their being known among themselves over the country, are subjected to a closer professional scrutiny than most other architects, — we think the provision to limit the choice of the Government Architect to the members of the Institute would prove, in the long-run, a safeguard to the Government. It is to be remembered, too, that the sole condition of membership to the Institute is the honorable practice of the profession, and that in effect no candidate of respectable attainment is ever rejected unless on the score of doubt as to the honor of his practice. But we doubt the wisdom of asking that three members out of four of the boards of experts be also members. This would be very well in the interest of the Institute; but that interest is not a fit subject for Congressional legislation, certainly not in establishing a bureau for the service of the Government. The tendency to special legislation is so strong in Congress nowadays, and so corrupting, that it becomes the Institute to avoid with great care the reproach which is likely to be brought against it, of making the public exigency a pretext for its own advancement. The share of the Secretary of the Treasury in the appointment of the board of experts is not clearly defined in the bill; but it is in reason that he should see occasions for appointing more than one member of a board from outside the Institute or the profession; and, if there is any suspicion for which it would be deadly to the Institute to throw out any justification, it is that of having axes to grind or logs to roll at Washington.

The provision for selecting the architect for public buildings in each case by competitions, we cordially approve, not because we think competitions an admirable means of selection, but because they are the only means that under the circumstances seem to offer promise of fairness. If well conducted by a properly qualified officer, assisted by a board of actual experts, they are likely to be more efficient in avoiding bad architecture than any other means that we can think of; and will also establish a standard of the greatest possible value for the conduct of the innumerable competitions which are, and will inevitably be, set up for important work all over the country. The position of the Supervising Architect, that all the designing should not be in the hands of one man, we have assumed to be beyond attack. Apart

from the fact that the task is now beyond the powers of any one man, the public architecture should have the advantage of the ideas of all its most capable men; and the profession at large should have the opportunity of showing its capacity for the work.

The bill provides that the architects selected in competition shall be employed to design and superintend the work. In practice it would be found impossible to limit competitors to the places where the buildings were to be. In many places there would be no local architects who could furnish satisfactory designs; and it would often be found desirable to appoint architects at a distance from where the work was to be done. In such cases it would be difficult, and often very undesirable, for the architect whose design was selected, to superintend the execution of it. Moreover there might be many other administrative difficulties, when a large number of buildings were to be carried on under supervision of one office, and when, therefore, a uniformity of system is essential, especially since the contracts are to be regulated, and presumably awarded, though this is not stated, at the Department in Washington. This is, in fact, the worst part of the bill. No machinery or even authority is provided for any supervision by the Government Architect, nor for any accountability to him on the part of the architects chosen to carry on the works.

The professional functions of the Government Architect are reduced to a minimum by the bill, being simply the "instituting" of competitions, the arranging of contracts, and the testing of such material as may be sent to him for use on government buildings. This last duty, to be sure, might prove laborious enough; but it is extra-professional. He is entirely debarred from what is every architect's leading ambition, — the carrying-out of his ideas in visible structures; for he is not only obliged to delegate the designing of all public work, but is forbidden to engage in private practice.

This last prohibition is reasonable, if his official work is made sufficiently important to engage his best faculties, and fully occupy his attention, as it ought. But to utterly cut him off from the architect's highest province of designing is to demand too great a sacrifice of professional ambition and feeling. It would be likely to make the office undesirable, and might deprive the Government of the advantage of the services of the very man whose service would be most valuable to it; for, if it secured him as Government Architect, it must lose him as designing architect, or, if it got the benefit of his skill in design, he could not be the Government Architect. On the other hand, it would be manifestly impossible for him to engage in competitions for government work: his honesty would be subjected to suspicion if he were successful in them; his practice and his prestige would both be lost if he were unsuccessful. The safer way would be, perhaps, to assign him a limited field for design, and yet one sufficient to bear out the dignity of his office, and make it an inviting one to men of talent. He might, for instance, be intrusted with designing the Government work in the District of Columbia, or with a limited number of buildings, or with work up to a defined limit of cost, or the competitions might be omitted when he was not engaged in any building of his own design. It is perhaps difficult to determine the best limit for his designing; but it seems unreasonable to appoint a Government Architect, and then to make his functions only those of a counsellor or supervisor, and not of an architect at all.

As for the testing of building-materials offered for use in the public constructions, it is quite desirable that it should be done, not only that the Government may know what is suitable for its use and what is not, but for the sake of everybody who is directly or indirectly interested in building, — that is to say, of the whole public. The country is full of an immense variety of building-materials, and there is very little accurate knowledge of their properties. It is very difficult to test them thoroughly; and practically it seldom is done except by actual use, which is a very expensive method. It is of course best performed by persons whose constant duty it is, and it requires expensive apparatus which it is not easy for private persons to provide. These, and its general importance, are reasons for having it done by the Government; but it would probably be an unwelcome addition to the labors of the architect, and it may be questioned whether the duty would not be more appropriate to the engineers, or some other branch of the War Department.

Of the question of the assignment of contracts for work, which is the only important point of the bill which remains, we have not now time to speak.

A BILL TO ESTABLISH A BUREAU OF ARCHITECTURE.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled: —

SECTION 1. That, for the purpose of securing artistic merit as well as intrinsic value in the public edifices to be erected by the Government of the United States, a Bureau of Architecture in the Treasury Department be, and the same is, hereby created by authority of law, for the purpose of providing for the discharge of all the duties appertaining to the general supervision, inspection, decoration, and repairs of all the buildings and grounds of the Government of the United States, exclusive of military and naval structures, such as fortifications, docks, arsenals, navy-yards, and light-houses.

SECT. 2. That this Bureau shall be under the charge and direction of one chief, to be named and styled the "Government Architect," who shall be appointed by the President of the United States from among the Fellows or Associates of the American Institute of Architects, by and with the advice and consent of the Senate, and with special consideration and regard to his professional capabilities and accomplishments. The Government Architect shall receive a salary of per annum, and he shall be allowed an assistant architect of his own appointing, whose salary shall be per annum; and the Government Architect and his assistant shall be allowed, in addition to their salaries, their actual travelling expenses when travelling on duty. It shall not be lawful for the Government Architect or his assistant to engage in private practice.

SECT. 3. That the Government Architect shall be, and he is hereby, authorized and directed to appoint and employ in the said Bureau one chief clerk with a salary of per annum, and a further clerical force not exceeding ; also messengers and watchmen; and their salaries shall correspond with those of clerks and employees of equal grade in other Bureaus.

SECT. 4. That, in addition to the clerical force provided for in the foregoing section, the Government Architect shall be authorized to employ the services of technical assistants and experts, whenever required for the public interest, who shall each be paid at the rate of not exceeding per diem. The Government Architect shall render to the Secretary of the Treasury, immediately preceding each session of Congress, an annual report; the said report to embrace estimates of the amounts required for the expenses of his Bureau for the year next ensuing.

SECT. 5. That the Government Architect shall institute and cause competitions to take place for the design of all and any architectural work under his jurisdiction, except in case of alterations and repairs of public buildings; and he shall establish uniform and equitable rules for a regular system of such competitions, of which the principal feature shall be, that, for each such competition, he shall call together a board of four experts, one of whom shall be appointed by the Secretary of the Treasury, and the other three shall be selected from among the Fellows and Associates of the American Institute of Architects, and who shall not be in any way, directly or indirectly, interested in the respective competitions for which they are selected as experts. The said board, together with the Government Architect as their presiding officer, shall decide upon the relative merits of the plan or plans submitted for the contemplated work or works. Their decision shall be final, and shall be filed in the archives of the office, and published in two leading newspapers of Washington. The successful architect of any competition shall prepare all necessary drawings and specifications, and shall superintend the execution

of the work, receiving a compensation for his services in conformity with the schedule of charges recommended by the American Institute of Architects. The compensation for the services of each of the four members of the said board shall be per diem, and travelling expenses; and their sessions shall be limited and regulated by the Government Architect.

Sect. 6. That the Government Architect shall also cause competitions to be instituted for the execution of every architectural Government work; and he shall establish uniform and equitable rules for their government. He shall embrace all such rules and regulations, as well as the results thereof, in his annual report to the Secretary of the Treasury.

Sect. 7. That the necessary accommodations for the office of the Government Architect shall be provided; and the archives, books, papers, models, drawings, apparatus, samples of materials, and whatever public property may be now in the office of the Supervising Architect of the Treasury Department, or of the Architect of the Capitol Extension, shall be transferred to the charge of the Government Architect for the use of his office; and that, from the passage of this act, the office of the Supervising Architect of the Treasury Department, and of the Architect of the Capitol Extension, shall be vacated, and these two offices discontinued.

Sect. 8. That in case of long sickness, or any other sufficient cause, by which the architect in charge of any of the Government work is prevented from attending to it, he shall be authorized to appoint a substitute, subject to the approval of the Government Architect: the said substitute shall assume the duties and obligations of the office thus vacated. In case of the death or resignation of any one of the architects in charge of Government works, the Government Architect shall appoint his successor. He shall also appoint the superintendents for the works in progress of construction or repair at the time this law takes effect. These appointments shall all be made with special consideration for professional capability and accomplishment. The compensation for the architects so appointed as substitutes shall be determined by the board of experts first called together.

Sect. 9. That the Government Architect shall hold the respective superintending architects in charge of buildings in process of construction, or of works of repairs, responsible for all deviations from the adopted drawings and specifications, and for any and all shortcomings in quantity and quality of material and labor.

Sect. 10. That no changes, alterations, omissions, or additions to the accepted plans and specifications shall be allowed to be made which may involve the change of the design or intention of the author, except upon the sanction of the Government Architect, who shall state his reasons therefor in his annual report, and file the same with the archives of his office.

Sect. 11. That it shall be the duty of the Government Architect to furnish annually to the President of the Senate and the Speaker of the House all estimates of cost of the needed and contemplated Government buildings, accompanied by a statistical statement, showing the population, amount of government business, prospect of increase, the opportunities for getting the various building materials in the respective localities, and such other information as may be required, to be laid before Congress at the commencement of each regular session; also all the reports of the boards of experts on the several competitions, and the condition and progress of the buildings in process of construction, and under repair.

Sect. 12. That he shall examine and test all building materials sent to him from any part of the United States, with a view to their use in public buildings, and communicate the result to the Secretary of the Treasury in his annual report. A copy of each report and a sample shall be deposited in a collection in his office for the benefit of the public. For this purpose, he shall be authorized to procure the necessary apparatus and assistance.

Sect. 13. That all acts and parts of acts inconsistent with the provisions of this act shall be, and the same are hereby, repealed; and all acts and parts of acts relating to the office of Supervising Architect of the Treasury Department, or to the office of the Architect of the Capitol Extension, not inconsistent with the provisions of this act, and which are necessary to enable the Government Architect to perform all the duties relative to supervising, repairing, renovating, and inspecting the buildings and grounds of the Government of the United States under his jurisdiction, be declared to be in full force, and have the same effect as though the office of Government Architect had not been created.

It is proposed to place a spire upon the tower of Chester Cathedral.

THE ILLUSTRATIONS.

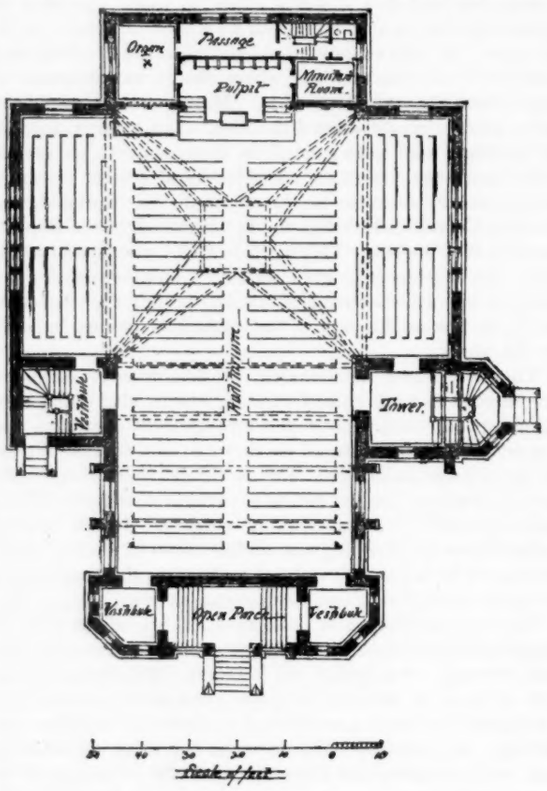
TOWER OF TRINITY CHURCH, NEW HAVEN. MR. EMLEN T. LITTELL, ARCHITECT.

THE ATRIUM OF THE CATHEDRAL AT PARENZO.

This plate supplements the view of the interior of the cathedral in our last number, and gives one or two additional details.

INTERIOR OF THE ACADEMIC THEATRE AT CAMBRIDGE. MESSRS. WARE AND VAN BRUNT, ARCHITECTS.

CHURCH AT LYNN. MESSRS. CUMMINGS AND SEARS, ARCHITECTS.



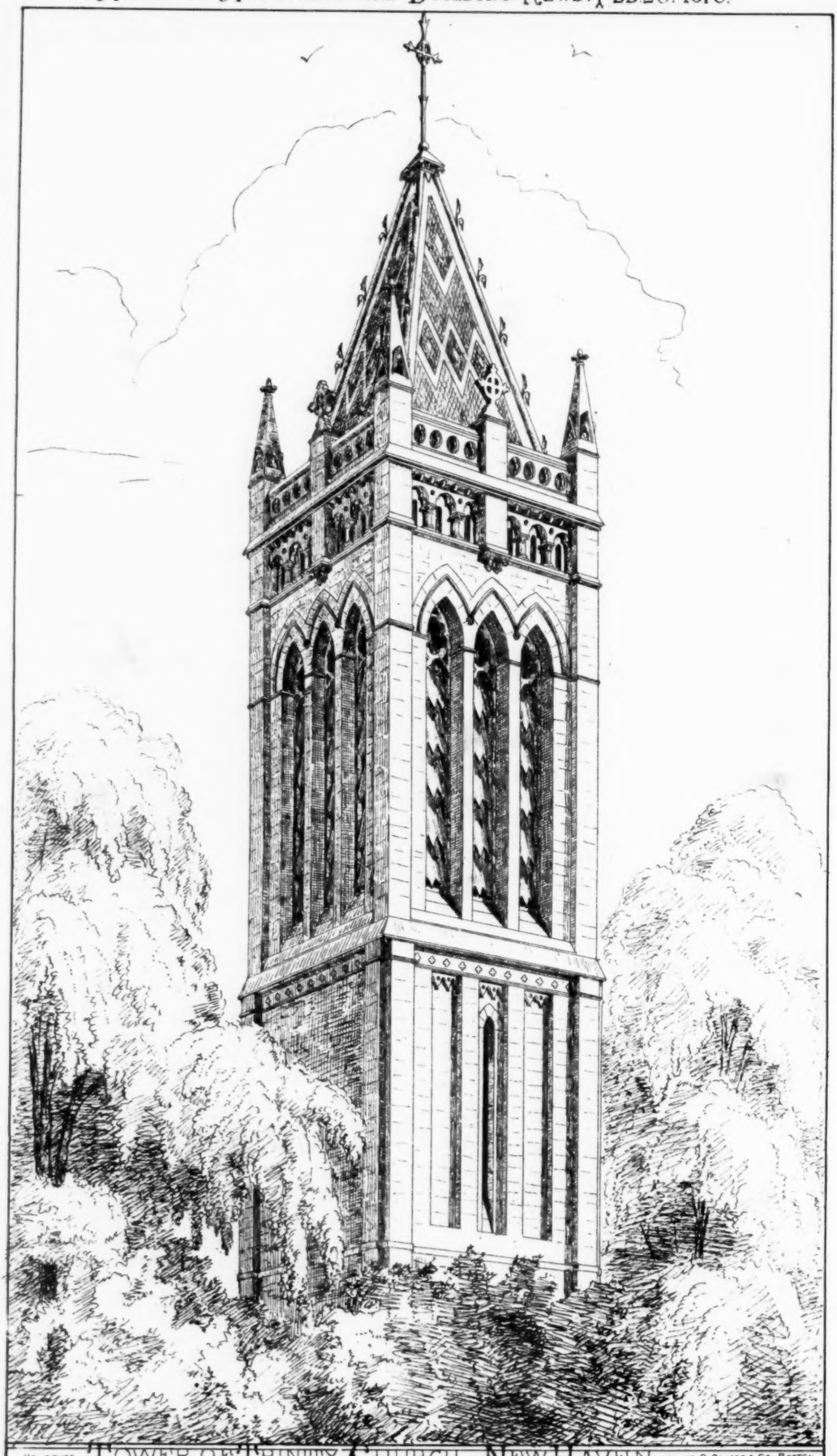
The list of exhibitors in the British section of the Philadelphia exhibition has just been published in England, and embraces almost all the largest manufacturing firms in the United Kingdom. London, Sheffield, Glasgow, Birmingham, Manchester, Liverpool, Huddersfield, Belfast, Dublin, Leeds, and several other manufacturing cities, will be particularly well represented. The list embraces names of fully seven hundred firms, embracing almost every known variety of industry. The display of machinery, woollen cloths and yarns and fabrics, fire-arms, linens, and cutlery will be very large and extremely attractive. The list of exhibitors from France numbers two thousand names. — *Bulletin Iron and Steel Association.*

The Chicago School of Art is said to be making good progress. The whole number of pupils is forty-five or fifty. The life class opened last fall, for male students only, is said to be doing good work.

THE HABITATIONS OF MAN.

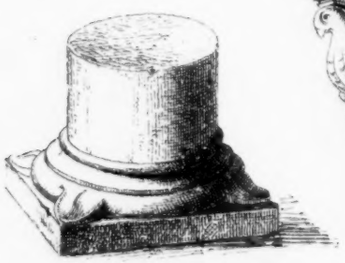
We are allowed to make some extracts from a forthcoming translation of a new work by M. Viollet-le-Duc, called "The Habitations of Man in All Ages," which will be published simultaneously during the coming spring, by Messrs. Sampson Low & Co. of London, and Messrs. Jas. R. Osgood & Co. of Boston. We give in this number the description of a Chinese house.

The house of the fat Fau (the name given to him by his servants), surrounded by shrubs and fruit-trees, consisted of a portico raised a few steps above the ground (fig. 9). This porch (P), very low and deep, gave entrance into a central room (A), lofty, and lighted near the wooden roof which covered it by openings fur-

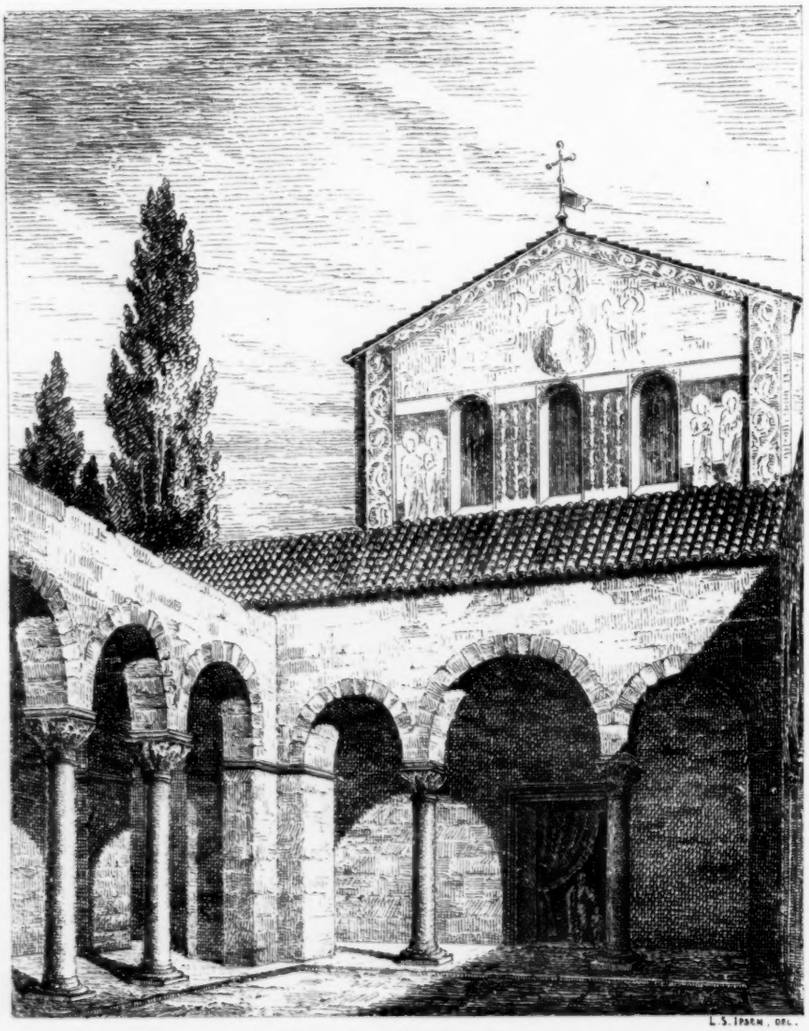


HELIOTYPE. TOWER OF TRINITY CHURCH, NEW HAVEN. JAMES R. OSGOOD & CO. BOSTON.

Capital of Doue.



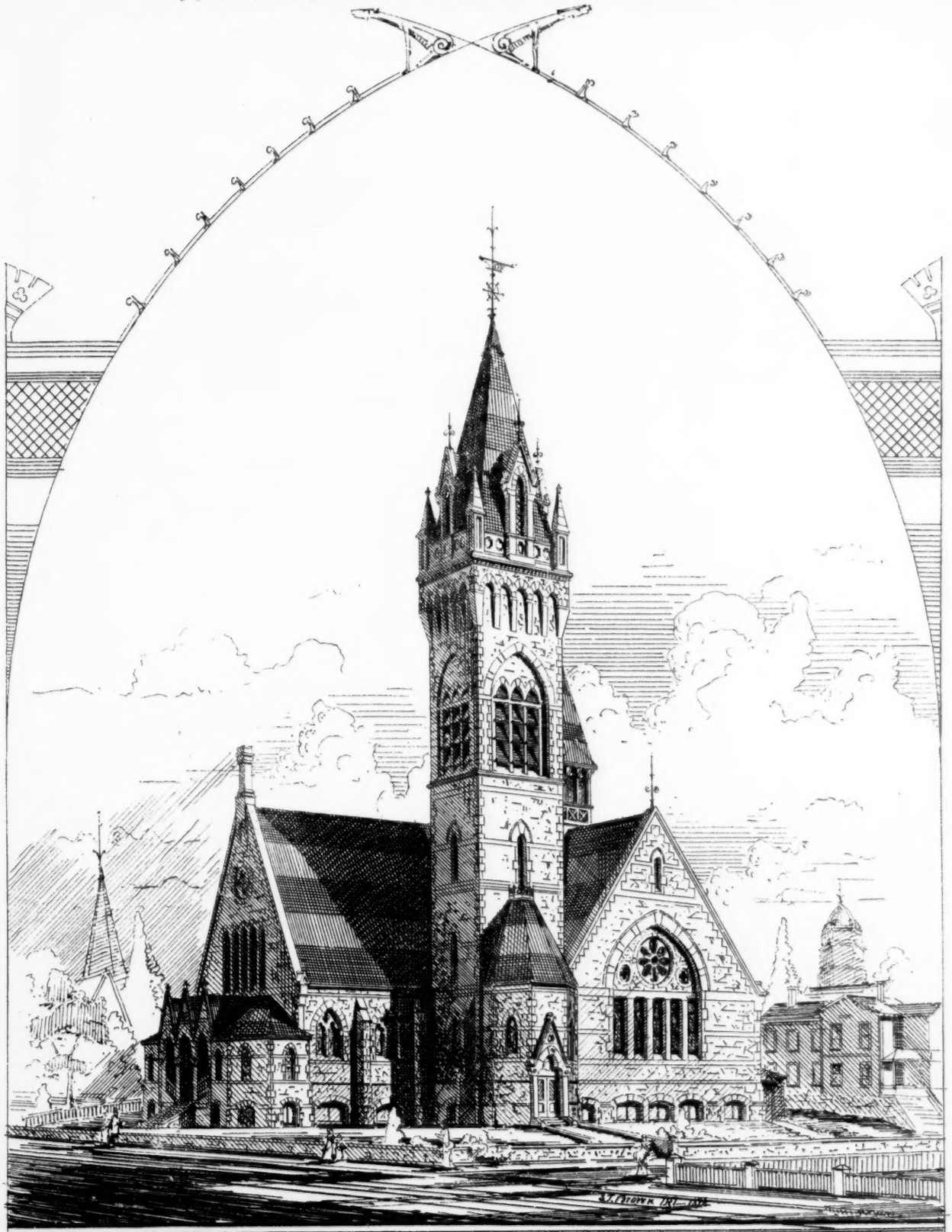
Base and Capital of Baldacchino.



L. S. IPSEN, DEL.

The Atrium of Cathedral in Parenzo.

HELIOTYPE JAMES R. OSGOOD & CO. BOSTON

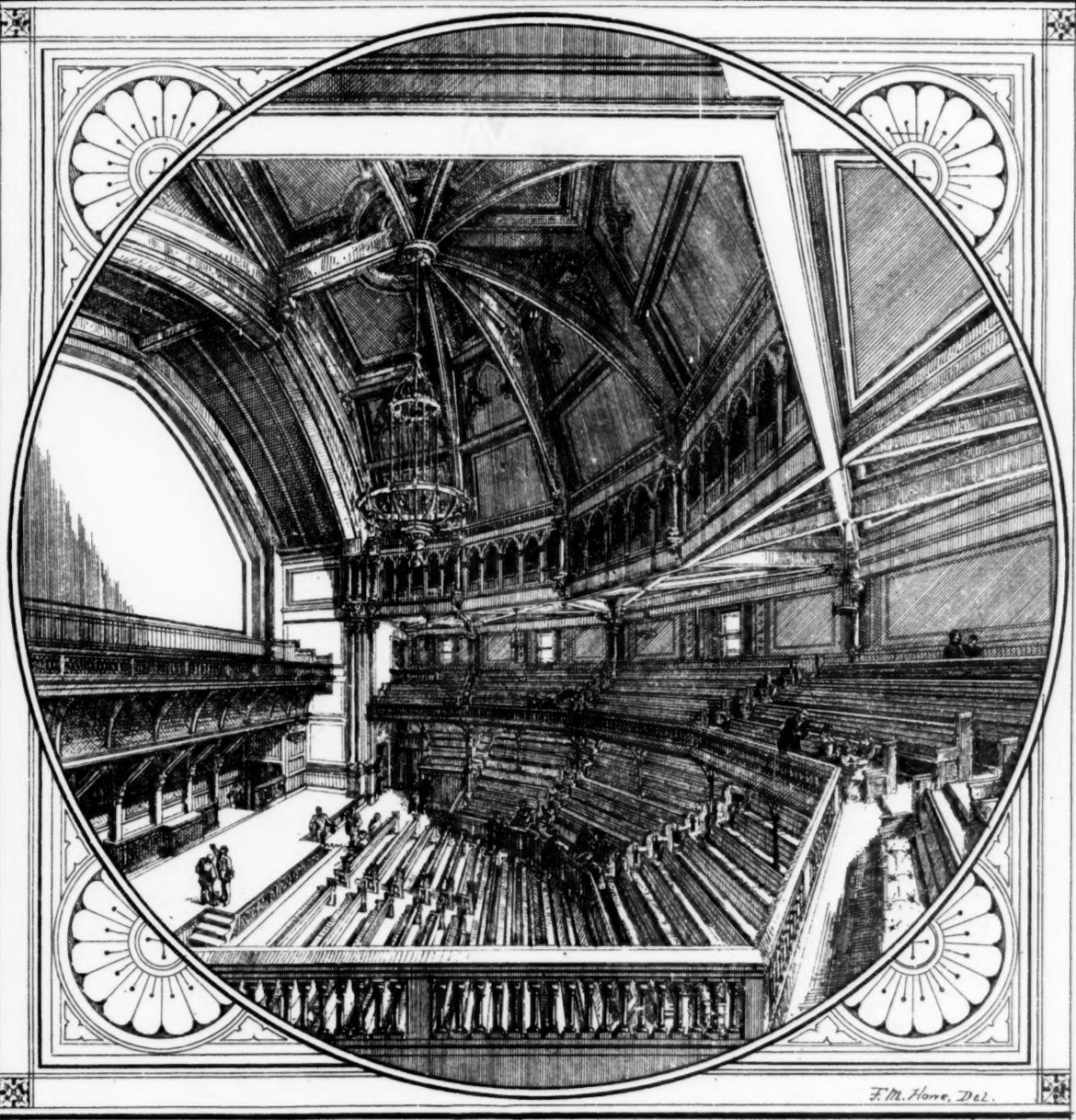


FIRST UNIVERSALIST CHURCH · LYNN · MASS ·

Cummings & Sears, Arch'ts
Boston, Mass.

HELIOTYPE

JAMES R. OSGOOD & CO. BOSTON.



F.M. Howe, Del.

THE ACADEMIC THEATRE
MEMORIAL HALL OF HARVARD COLLEGE.
WARE AND VAN BRUNT, ARCHTS. BOSTON.

HELIOTYPE JAMES R. OSGOOD & CO. BOSTON

nished with a trellis-work of canes. On this room opened two side rooms (B), very much less in height, and a narrow passage which led right and left to two covered balconies projecting on brackets (C). One of these overlooked the river. Behind this gallery another

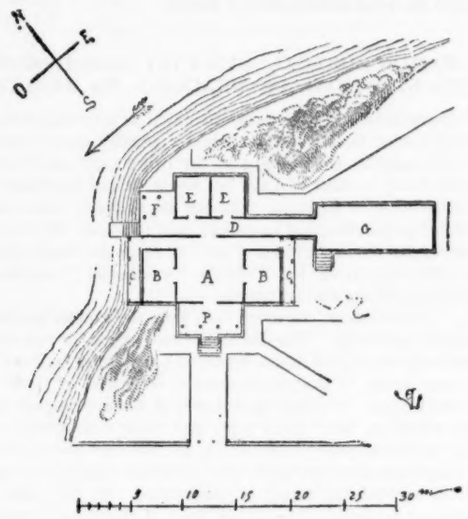


Fig. 9.

wider one (D) led on to a terrace (F), to two small chambers (E E), and to a long low building (G), allotted to the servants and the offices, such as the kitchen and provision stores. On the terrace (F) were posts from which mats might be hung, enabling the occupants to enjoy the fresh air of the river under cover. A small landing-stage descended from this terrace to the river, to facilitate excursions on the water.

This building was constructed entirely of bamboos. Trellis-work of cane, tastefully composed, closed all the openings, and allowed the air to circulate, while it subdued the glare of the sun-

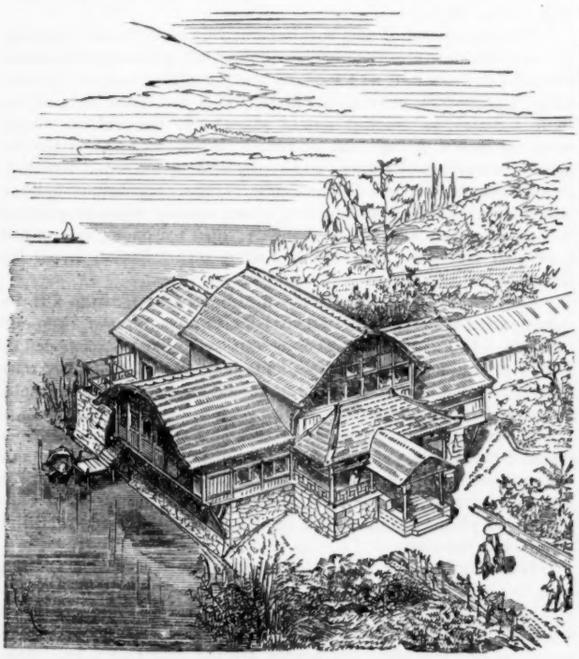


Fig. 10.

light. We give (fig. 10) the view of this habitation on the entrance side, and (fig. 11) the aspect of the porch.

Great roofs, made of thick bamboos bent, and covered with reeds very ingeniously disposed, sheltered the interior from the rain and heat; for these coverings were thick. Close mats, made likewise of reeds, enabled the openings to be hermetically closed during the night, and covered the floor. The building rested on a base consisting of large stones, perfectly fitting, though irregular. The whole was painted outside and inside with lively colors, among which yellow and green predominated. On being introduced into the principal room, whose aspect was cheerful, and whose agreeable temperature contrasted with the oppressive heat of the outer air, Epergos examined with curiosity the arrangement of the bam-

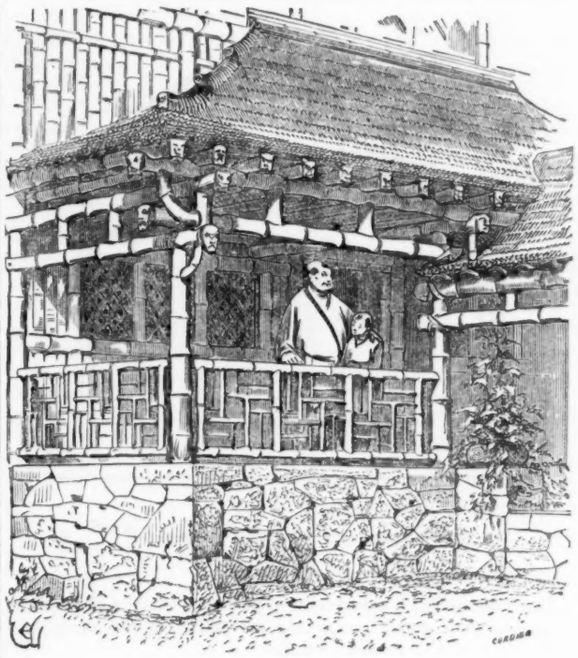


Fig. 11.

boos which formed the lofty ceiling, lighted by openings pierced above the entrance and on the side opposite (fig. 12). His examination would have been continued had not the fat Fau invited his guests to seat themselves on thick mats which covered a sort of platform raised in the middle of the apartment.

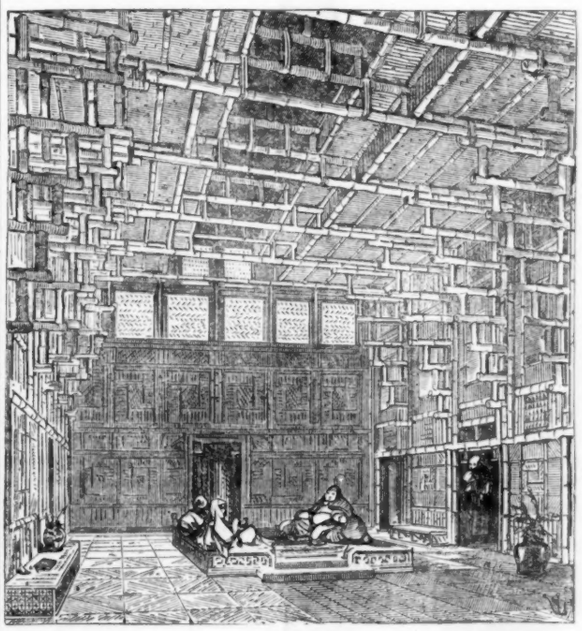


Fig. 12.

Fau was scarcely capable of showing his domain to his visitors. The steward of his household was commissioned to conduct them everywhere. Epergos was able at last to examine at his leisure every corner of this abode, except the room where the wife and daughter of his host were shut up. It was one of those which opened on the large room. At every step Epergos uttered an exclamation. The bamboo framing supporting the roofing of the principal apartment was the chief subject of his remarks (fig. 13).

"See," said he to his companion, "how, with materials apparently so weak, these men have succeeded in making a large roof, as light as it is strong. How cleverly these brackets are managed! how freely does the air circulate in these rooms to prevent the discomfort caused by the heat of the climate!"

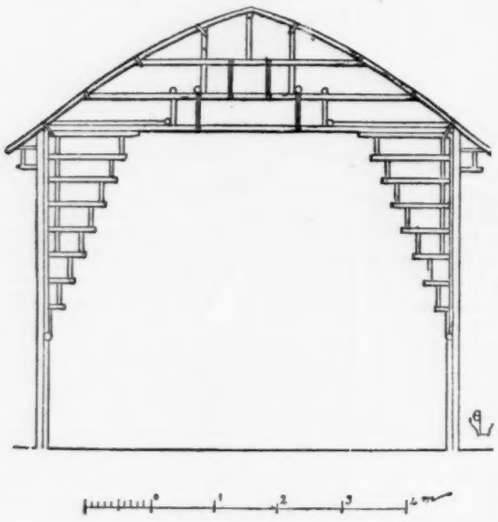


Fig 13.

The framework of the structure consisted entirely of bamboos of various thicknesses, intersecting and bracing at the same time in the simplest and strongest manner.

Seeing how all the parts of this house held together, Epergos asked himself how it was that all human beings had not discovered combinations so naturally suggested, and requiring so little intellectual effort. He studied with particular attention some of the bamboo framings presented in fig. 14. To connect these canes,

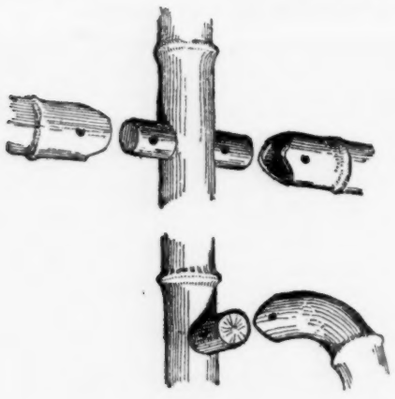


Fig. 14.

at right angles, the builder had put crosswise, through one of them a cylindrical piece of wood, which fitted, as a tenon would do, into the cylindrical cavities of the bamboos to be framed together; these pieces were secured by pegs. He saw that the light canes which composed the balustrades of the portico were joined according to the same method; and he perceived that the rudely carved heads which finished the ends of the horizontal pieces of the porch outside were merely a kind of cork fitted into the cylindrical cavities of those pieces (fig. 15).

Fig. 15.

Reflection, however, suggested to Epergos that for the origination of the idea of so framing these canes of various length and thickness, the first condition was the possession of the materials. But no vegetable growth of this kind was to be found among the mountains inhabited by the Aryas, for example; and, if they possessed them, the climate of those altitudes was too severe to allow of such structures affording a shelter. In these vast and humid plains, on the contrary, these open-work habitations were the most suitable ones. He communicated these reflections to Doxius, who did not fail to insist upon it that all would be for the best, and in its place in the world, if he, Epergos, did not constantly interfere to disturb the established order of things.

THE BOSTON MEDICAL SANITARY COMMISSION ON THE RELATIONS OF DRAINAGE TO HEALTH.

The commission of physicians appointed to investigate the sanitary condition of Boston has published a lengthy report (prepared by Dr. Thomas B. Curtis) which, for originality and thoroughness, may fairly be said to have no equal in our language. We know of nothing in England that has so skilfully dissected the statistics of population and mortality, and so shown the respective influence of the various grades of society upon the death-rate.

The following, from Dr. Curtis's "sanitarian" section, is of interest to architects and engineers: —

"The '*filth-diseases*' occasion each year the greater part of our preventable mortality. The diseases whose origin or transmission is manifestly dependent upon infection by filth are typhoid fever, and certain forms of diarrhœal disease, the chief of these being cholera infantum. Certain other classes of diseases appear to owe, in some measure, their fatal type, and their wide-spread prevalence, if not occasionally their origin, to filth: we allude to scarlet fever, diphtheria, and perhaps cerebro-spinal meningitis, as well as certain exceptional forms of pneumonia. In the case of all these diseases a partial dependence upon filth-infection has been suspected, if not actually demonstrated. Moreover, it appears to be not unlikely that many other forms of fatal disease, whose origin and whose processes show absolutely no causal dependence upon filth, may nevertheless find easier victims in those sufferers whose general health has been previously undermined by filth-poisoning, recent or chronic, and may so owe their destructiveness in part to this powerful morbific agency. These considerations indicate that the sum total of deaths attributable, directly or indirectly, to filth, is much greater than the yearly mortality occasioned by the manifest filth-diseases would make us suppose; and we are led to conclude that *the prevention of filth-infection in its various forms constitutes, without any doubt, the greatest and most urgent sanitary need of Boston.*

"The attainment of this end imperatively calls for the adoption of energetic measures designed to prevent all possible contamination of our air, water, and food, by the putrefying organic matters of all kinds which constitute 'filth.' Dirt has been defined, by Sydney Smith, as 'matter out of place.' So the filth of which we speak is but sewage out of place. When confined within its proper channels, and therein constantly undergoing rapid removal, sewage is harmless, and does not deserve the opprobrious epithet which it incurs under opposite conditions, namely, when stagnating without or even within its channels; then poisonous vapors are generated and given off, which convey filth-infection in all its forms.

"By no other means can the purification of our city from filth be encompassed than by the rapid and continuous *removal* from our midst of all refuse matters, such as constitute sewage, comprising solid and liquid excrements, foul household waters, &c. Any reliance upon 'disinfectants' as a means of public sanitation would be but a delusion and a snare.

"In few words, then, what is needed is a rapid and continuous translation of our sewage from its initial starting-points, the water-closet or the privy, and the sink, throughout the entire series of intermediate channels, until it reaches the terminal outlets of our public sewers, which should be situated far beyond the confines of the city.

"It is easy to show, that, with such suitable provision for the complete and rapid removal of all sewage, the escape of noxious emanations from the sewers into our streets and dwellings would be rendered impossible. The conditions under which sewer-gases are generated and penetrate into houses are the following: 1st, *Stagnation of sewage*, by which its putrefaction, and the consequent generation of poisonous vapors, are favored; 2d, *Absence of sewer ventilation*, by consequence of which circumstance these vapors are confined and pent up, until they acquire a sufficient degree of tension to force the barrier by which we vainly attempt to exclude them from our homes. By the rapid removal of sewage, on the other hand, its putrefaction in our midst is forestalled; the generation of noxious vapors within our drains and sewers is reduced to a minimum or wholly prevented; the ventilation of the sewers is rendered easy and harmless; and finally such air, gases, and vapors

as may be contained within the sewers, being no longer confined, but finding an easy escape into the open air, are no longer liable to be forced back through the traps of our household drains and soil-pipes.

"The foregoing *résumé* of the conditions under which filth-poisoning takes place, and of the means by which it may be prevented, is designed to show that *the proper management of our sewage is not by any means a question of sewers only;* but that it involves the necessity of a suitable provision for the removal of excreta and refuse of all kinds from the very interior of our dwellings, and for their speedy translation through all the intermediate channels (water-closets, privies, sinks, soil-pipes, and household drains) which connect our houses with the public sewers. By consequence of the solidarity which connects private household drainage and public sewerage, it becomes necessary that all the various arrangements which have in view the removal of sewage should, from the beginning to the end of their course, constitute, as far as possible, parts of one common whole, systematically devised for harmonious co-operation, and placed under one common jurisdiction. It is therefore evident that the question of the future sewerage of Boston is one which should be understood and acted upon in the most comprehensive manner.

"Let us add that the interests of the public in the matter of properly organized drainage demand that our sanitary authorities be permanently invested with complete jurisdiction over sewage from its first starting-points within our homes, as well as throughout the entire extent of its ulterior transit; and that they have full powers in all cases to inspect and supervise, when needful, the construction and the operation of the internal drainage arrangements of dwelling-houses.

"It does not come within our province nor our competence to prescribe the manner in which the requirements of Boston in the matter of household drainage and public sewerage are to be satisfied. The mechanical difficulties to be met by the engineer in devising suitable means for such a treatment of our sewage as sanitation demands are no doubt great, but not insurmountable; and the whole matter is in the hands of a special commission which offers every guaranty of its ability to devise the best possible plan for the end in view."

WOODEN VAULTING.

To the Editor of the American Architect.

Sir, — It was, as I said, "surprising" to find Mr. Van Brunt designing the ceiling of the Harvard Memorial Hall, illustrated in your second number. It is really distressing to find him defending it. I would rather have supposed that the "tasty" client, who is always insisting on pediments over flat roofs, and bay-windows commanding alleys, had had his wicked will of Mr. Van Brunt, who had yielded the point in order to save something he thought more important.

Mr. Van Brunt's ingenious defence may be summarized in three points: 1. The system of vaulting in wood, which he employs here, was practised by English mediæval architects. 2. A vaulted ceiling is "a mere matter of decoration," and not amenable to the laws which govern the constructive features of a building. 3. The vaulted ceiling of the Harvard Memorial Hall will nevertheless bear being judged by those laws, and is æsthetically and constructively correct.

1. The archæological question I am neither qualified nor disposed to discuss with Mr. Van Brunt. If people did such things in the middle ages, all the worse for the middle ages. But I can confidently deny that a wooden vault of the form used by Mr. Van Brunt in the ceiling of the Harvard Memorial Hall was ever anywhere "generated by a rational process" as the solution of an architectural problem in timber construction; and confidently assert that a wooden vault of that form, wherever it is found, is the reminiscence and imitation of a type previously developed out of stone construction.

2. "It is this necessity for a stone roof," Fergusson says; and on this point I am not aware that any attempt has ever been made to confute him, "that was the problem to be solved by the architects, and to accomplish which the style took almost all those forms which are so much admired in it." That the mediæval builders did not see their way to making this fire-proof roof the only covering of their buildings, and were forced to put a water-proof roof over it, is true enough, and has often been made a reproach against the Gothic style; but it has never been held, to my knowledge, except by Mr. Van Brunt, that this fact converted the fire-proof roof into "a mere matter of decoration," and absolved the builder from treating it constructively. The rule, never to construct a decoration, may or may not be absolute; but, if there is any force in it at all, it ought to prevent the construction of a decoration 30 x 100, pretending to be the covering of a room. Certainly, if the mediæval builders had taken this view of their ceilings, they would not have generated by a rational process the forms which Mr. Van Brunt has been led by what to me seems an irrational process to reproduce in another material. From such work as theirs, we derive the definition that architecture is the expression of construction. If Mr. Van Brunt's ceiling and his argument are right, it would be better to define it as the construction of expression.

3. "It is no offence against any rule of construction or art," says Mr. Van Brunt, "to throw wooden arches across at the proper height, and to connect them continuously with a superimposed ceiling of wood, as in a wagon vault," &c. I beg his pardon, but it is. What are "wooden arches"? An arch is not merely a form: it is a form expressive of a certain mode of construction, which mode of construction is the most direct and economical way of getting over an opening in stone or brick, but is "wasteful and ridiculous excess" when it is imitated in wood. The form becomes then an empty form, expressive of nothing save by "traditional association" or something of that sort. Imitation does not consist in falsely representing the surface of a material only: it consists, as here, in denying the nature of a material. "This same form of vaulting," Mr. Van Brunt says, "if executed in stone would have had the obvious monumental advantage of greater durability, and the obvious practical disadvantage of greater expense; but not greater would have been the necessary sympathy and alliance between the material and the form." I do not see how he can say that. If there is a "necessary alliance" between stone and this form, as there is, there cannot be a necessary alliance between wood and the same form. It is simply out of the question that a design for a ceiling can be equally right and expressive whether it is executed in wood, or stone, unless it is utterly wrong and inexpressive in either. Surely Mr. Van Brunt cannot mean that the curved ribs in your illustration indicate the best way, or a good way, of bridging an opening with wood. He cannot mean that they are joined together in a manner expressive of wood construction, or that his bosses ("keywoods," shall we call them?) express any thing belonging to carpentry. How, then, can there be a necessary alliance between his material and his form? An engineer called in to devise a stone ceiling for the Harvard Memorial Hall would, if he were intelligent enough, arrive at forms essentially like Mr. Van Brunt's; keeping in mind only the engineer's definition of good masonry, — "the least material to sustain a certain duty." To expect that he would develop the same forms, or any thing like them, on engineering principles in a timber ceiling, seems to me as monstrous as to expect him to produce a system of beams and braces to be executed in stone. If Mr. Van Brunt's brown ash vault were presented to him as the solution to *his* problem, he would certainly reject it; and he would be justified, as an engineer, in describing it as "nonsensical." It follows either that the thing is nonsensical, as I said it was, or else that bad engineering may be good architecture, — a proposition which I trust Mr. Van Brunt will not distress me afresh by maintaining.

The Critic of the Memorial Hall.

VAULTING OF MEDIÆVAL CHURCHES.

Feb. 14, 1876.

To the Editor of the American Architect.

Sir, — In Mr. Van Brunt's reply to the critic of The New York World on the subject of wooden vaulting, — contained in The Architect of Feb. 12, — I was struck by the following passage: "Of whatever material they are composed, these ceilings are mere matters of decoration." Just before this, he says, "Gothic vaults, whether of wood or stone, are interior features, — ceilings covered by wooden roofs." In all the schools of Germany, it is taught that these ceilings, or vaults, in the old cathedrals, subserved quite another purpose: they resisted the spread of fire from the wooden roof to the body of the church. Without the roof above, rain and frost would soon have disintegrated the mortar and stonework; while, without the vaulting, the beams would, on burning, have fallen directly into the body of the church. I had the fortune, two years since, to ascend to the upper surface of the vaulting in the Cathedral of Chartres, and was told by the custodian that the present roof — a beautiful structure of iron and copper — was a recent addition; while the former one of

wood had burned away some years ago. He also said that many large beams had then fallen upon the heavy vaulting, but had in no case broken through. I also visited, at a later period, the roof of the St. Laurenz Church in Nuremberg; and was impressed with the thickness of the masonry, and its power of checking a similar conflagration. The space gained between the vault and roof is also utilized for windlasses for raising and lowering chandeliers, canopies, &c., — cords and chains for this purpose passing through holes in the vaulting. This same space contains naturally also a large body of air, which serves as a non-conducting medium for heat and cold to the church itself. The difference of temperature was very marked at Nuremberg. In the case of the Pantheon at Rome, the masonry, as I understand it, was covered directly with sheets of lead. The opening at the centre of the dome doubtless acts in this building as an effectual ventilator.

Nelson L. Derby.

FIRE-PROOF CONSTRUCTION.

To the Editor of the American Architect and Building News.

Dear Sir, — We have been for many years close students of the action of fires, and the results of so-called fire-proof construction; and our experience in the same has been a very large one. We do not propose to give our opinions however, or our theories, but simply to bring to notice certain facts of which Mr. Hutton appears to be ignorant.

He says: "The experience of these great fires (Chicago and Boston) indicates plainly the utter inutility of any attempt to construct buildings capable of preserving uninjured themselves and their contents when exposed to such heats as were there developed."

There are always men in the world who say, "This can't be done," "That can't be done;" and there have always been men who came along and did these impossibilities.

So in this case, there were buildings in Chicago that stood the fire, the hottest of it, with but little damage; and the part that failed was simply a thin, soft brick wall, that certainly was a thing easily remedied. Again Mr. Hutton says, speaking of iron, "In all the various forms of corrugated iron for floors and roofs as a fire-proof material it is *utterly useless*." (The Italics are ours.)

Let us again bring the facts forward. There were in Chicago, and in the path of the fire, four buildings with our floors (corrugated iron arches). These buildings were in the hottest part of that fire; yet, when the fire was over, those buildings still stood, damaged somewhat, to be sure, but not destroyed; and the cause of the damage was so apparent that no one could fail to see it. We have the written testimony of the owners of these buildings, that the floors "failed *only* where the walls were defective and failed to stand."

Moreover, these were the only buildings which did stand at all, except the United States Post Office, where the walls did remain after the fire, but the floors (brick) and all the interior were completely carried away and used up. The inference is perfectly unavoidable, that, if the Post Office had been supplied with our floor and roof, it would have been practically unharmed.

Mr. Hutton adds to the above statement, as proof, these words: "As was markedly shown in the rapid destruction of the Brooklyn Tabernacle."

The Brooklyn Tabernacle was a huge structure of wood, with a large wood roof supported on wood columns, the floors, the sides, and the roof all connected; the corrugated iron was used as a *partial* outside covering (there was a four-foot wooden cornice), and for panels on the inside, the pilasters and mouldings being wood. The sole purpose of the iron, apparently, was to make flues filled with the best combustible material, and open at both ends for purposes of draught. Now, the sum of the whole matter, as far as we are concerned, is this, that our *iron* floors have been through the hottest fire of this country, *and successfully stood the test;* that *no other floors* have stood the test of actual fires in this country; and therefore, while Mr. Hutton may advocate Béton, Coignet, or any other composition, and has perfect right so to do, he has no right to speak of the impossibility of making fire-proof buildings.

We presume our manufacturers will have by this time informed Mr. Hutton that the inverted V girder or beam has been rolled for some years in this country, and he will find the diagrams upon the catalogues of several of the well-known rolling companies of this country; and any civil engineer will tell him that such an increase of strength over the double depth I beam as he reports was simply impossible, although the V girder is a very good thing for some purposes.

It is a very common thing for architects to compare our buildings with those in the South of Europe and France, and say: "Build like them, and you will be safe," &c. Such entirely forget or ignore the different conditions. One of our ordinary office buildings in New York generates and disseminates more heat during a winter than a hundred buildings for similar purposes in Paris. It is also quite the fashion to quote the "late lamented American sculptor Powers," upon Florentine and American fire-proof building. Why a man, because he was a leader in the art of sculpture, should be considered authority in fire-proof construction, we never knew; or why a man who for many years had not seen this country, and who knew nothing of the innumerable "modern improvements" that have filled our American buildings, and their enormous size, should be able to advise understandingly upon something as far removed from his own line of thought as any thing could be, we fail to see. However, we are inclined to think that the best architects agree with us, that such "comparisons are odious."

Very respectfully,

Geo. Dwight, Jun., & Co.

Springfield, Mass.

NOTES AND CLIPPINGS.

The Ohio Centennial Building. — The Ohio building on the Centennial grounds will be 40 feet square in the inside, two stories high, with an attic, a hall 9 feet wide through the centre, on one side of which is a ladies' parlor, 25½ by 15½ feet; in the rear a dressing-room, wash-room, and closets; on the other side are an office, gentlemen's room, and conveniences for the press. Registers, for recording the names of visitors and exhibitors, will be kept in elegantly bound books, which, after the exhibition closes, will be deposited in the State Library, and in after-years will become of interest to examine. The roof of the building will be of metal painted with iron-clad paint. The foundations are finished, and it is expected that the whole will be completed by the 1st of May next. Twenty-four different stone-quarries, embracing the leading sandstones of the northern and southern portions of Ohio, as well as Dayton, Columbus, and Springfield limestone, will be represented in the structure.

The chief topic in the Parisian art-world at present is the threatened destruction of M. Baudry's paintings in the *grand foyer* of the new opera-house. Gas and foul air are certainly amongst the causes of this; but there is little doubt that the architect of the building and the artist himself are much to be blamed, the first for placing so many chandeliers near the paintings, and the second for not having adopted a more decorative style. The elaborate composition of the paintings made them, even when they were freshest, difficult to judge at such a height, for the *foyer* is far too lofty for its width. On the opening day it was generally observed that the coloring and the figures themselves seemed powerless in comparison with the effect produced when they were placed nearer the eye at the private view at the *Ecole des Beaux Arts*. However, M. de Chennevières, the Director of Fine Arts, proposes to have M. Baudry's paintings removed without delay, and replaced by copies of the same, the cost being over fifteen thousand dollars. But if the copies should happen to become so badly injured in the course of a year or so, as to necessitate another change, the scheme may prove rather expensive. Besides, no one seems to know where the artist's original paintings are to be placed. — *Architect*, Feb. 5.

Griffith's enamel is a recent invention which is said to be unaffected by the action of carbolic acid, and hence useful for coating the inner walls of fever wards in hospitals. Plates of iron covered with this enamel, and exposed to the prolonged action of sea-water, are said to be kept fresh and clear from seaweed, the iron itself showing no signs of rust after the enamel is scraped off. It has been used by the British and other foreign governments. In India it is reported that it does not blister under the sun's heat. It has also been found effectual as a protection against white ants.

The Constitutional amendment creating a Superintendent of Public Works, who shall have entire control of the canals, has been passed by the New York Assembly. As the amendment has already passed the Senate, it goes now to the people, and needs only their vote in approval next fall, to become a part of the Constitution. — *N. Y. Tribune.*